Sampling Vs. Population

Population: When all data required for observation / analysis is collected and studied, the data is referred to as the population.

Sample: When limited data is being collected / analyzed, this data is referred to as sample and is used as an indicative of the entire population.

Population Mean	Sample Mean
$\mu = \frac{\sum_{i=1}^{N} x_i}{N}$	$\overline{X} = \frac{\sum_{i=1}^{n} x_i}{n}$
N = number of items in the population	n = number of items in the sample

Where, μ = Population Mean

N = Population Count

x̄ = Sample Mean

n = Sample Count

Types of Sampling Technique

1. **Random Sampling Technique**
   We randomly select some sample from entire population is nothing but random sampling.
2. **Stratified Sampling Technique**
   Consider an example where your selecting 1000k data point as sample but in that 1000k record 700 are men and 300 are women, so this is biased. 7:3
   In stratified sampling we select equal amount on all the category.
3. **Systematic Sampling Technique**
   Suppose, we are selecting 5 samples from entire population. So we will select 10^{th} data point from each sample I nothing but systematic sampling.
   Selecting specific position / nth value from each sample is systematic sampling.
4. **Cluster Sampling Technique**
   This can be work based on some domain. Consider, I want to survey in field of AI. The person who is doing this survey should be expert in their domain field.